

AC 2007-2012: INTERNATIONAL ASPECTS OF COMMUNICATION TECHNOLOGIES AS A TOOL FOR LEARNING

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International Aspects of Communication Technologies as a Tool for Learning

Abstract

There is a belief in the education community that the traditional teaching-learning models do not scale to meet the new challenges created by emerging technologies in every nation. Educational institutions are looking for ways to reach students when faced with increased competitions, shifting demographics, and delivering education to isolated areas. One way this problem has been tackled is through communications technologies as a mean to enhance flexible delivery and student learning on-line. As Internet has become a way of life, web-based educational course management systems have become popular.

WebCT, BlackBoard, and ANGEL are among few popular learning web-based tools. These tools enable faculty to post documents and files, securely post grades, track students' activities, interact with their students through e-mail and instant messaging. In addition, students can also use these tools to engage in group work and collaboration, online note-taking, take practice quizzes with immediate feedback, keep up progress tracking, and constant access to grade information at the instructor's discretion. The focus of these web-based tools is to aid instructors develop meaningful learning experiences and improve learning outcomes which will aid students in their course.

The objective of this paper is to present the advantages and disadvantages of these three common types of computerized tools used on-line in reaching customers and institutions of higher learning around the world. Moreover, this paper will help individual faculty members and instructional designers who are considering course management systems. The results of this study indicated that using these web-based tools assisted both distance and on-campus students and their learning levels are comparable.

Introduction

When the World Wide Web was launched in 1991, there was a surge of interest in the possibilities of electronic leaning (or e-learning). The use of the Web as an educational medium was just the beginning and today electronic learning offers online degree programs and online courses, for both on and off campus courses ¹. This has allowed an access to education that can be always expanded and has also impacted student enrollment throughout many universities. Today, instructors around the world are being encouraged to utilize alternative and flexible delivery methods within a number of universities in North America and in other countries.

In North America, virtually every institution of higher education conducts some form of e-learning. Australia has adopted e-learning technology on a broad scale to bridge the distances separating its population centers. In addition, UK, Europe, and Japan are steady adopters, while interest is continuing to grow in many other regions around the world ².

This paper will evaluate three learning management systems (LMS): WebCT, Blackboard, and a new global environment for learning (ANGEL). Each LMS program is based on the ability to

accommodate different active learning experiences in distance and on campus students taking courses. The comparison will reflect faculty and student perspectives, references, advantages, and disadvantages. A learning management system must address the needs of the ultimate user and learner. Each LMS has key features that allow students to be actively involved in their courses and allows faculty to better organize course material and information. The different learning management systems extend teaching and learning and engage learners in a deeper learning experience.

In choosing and using any type of courseware, an instructor needs to have components that will allow them to create active learning courses. Learning is not a passive activity. Students actively participate in traditional classes by listening and talking to other students and the instructor. In an online classroom, an instructor needs to create an environment, which has the students actively participating in lessons and discussions. Through the use of discussions, students are able to ask questions, post opinions, create forums on course material, allow to connect with the instructor and other students in the course. This connection on-line allows students that are shy in class to participate more and also allows students to feel that they are part of the course.

Once there is a critical mass of learning activity taking place online, institutions will be able to analyze outcomes as well as activity patterns to better determine what leads to students success, redistribute learning objectives, and use those insights to improve the overall quality of the educational offerings².

Learning Management System Features

LMS can offer different kind of features to develop and design the course. It can be used as a course management tool to development the course content. It can allow students to work together in groups, share documents, post announcements, offer student learning and study tools, have discussions or chat rooms, send e-mails, provide audio and video, monitor student participation and progress, and schedule and post important announcements. Online course with just lecture notes or slide presentations do not allow users to be active participates in the course. LMS offers more to the course to get students involved. One of the features that LMS offers are bulletin boards and discussion areas. Discussion brings a dynamic element to the online class. They allow students to communicate with the instructor and with other students. Each LMS offers different features and the instructor needs to decide which ones are important for the success of the students. Tables 1 through 3 show all the features that each LMS offers in bulletin board and discussion area.

Course Development and Design

How effective and efficient is the LMS depends on how the course is developed and designed. The course should be student centered to give support and motivation in learning. In an online course, instructors need to be able to upload lecture notes and other course material so the student can process and understand the course content. Therefore, and instructor should choose an LMS that supports a student centered approach. It should allow the instructor to design high quality material and includes support mechanisms that are available online for the students³.

WebCT, Blackboard, and ANGEL gives the flexibility for instructors to select different course components, create a copy of an existing course, upload files, and hide work in progress, see Table 1. Depending on how the instructor wants to manage his or her course will also depend on the LMS available. For example, in ANGEL, instructors cannot edit uploaded text online. The instructor would have to edit it offline and then upload it to the website. There are pros and cons to all of the LMS.

Group Participation and Discussions

Instructors, national and international, are experimenting with synchronous technology to enhance their students' online learning experience. This is done by offering synchronous tools that add a valuable new learning dimension that goes beyond that of other online tools, such as e-mail. Each LMS allows students to work with the instructor or work in groups with other students. For example, ANGEL's random team generator guides instructors through the team creation process and even creates teams based on instructor-defined criteria⁴. LMS offers on-line chat between peers, virtual office hours, private bulletin boards, discussion forums, web content presentation areas, and peers sharing files with other peers. WebCT, Blackboard, and ANGEL each have distinct features that allow the students and instructors to build this collaboration with each other and with groups, see Table 1. It also frequently reduces questions and email to instructors.

Technology can strengthen faculty interactions with all students, especially with shy students who are reluctant to ask questions or challenge the instructor directly. This may be done by placing a more "distant" source of information and guidance for students. It is often easier to discuss values and personal concerns in writing than orally, since inadvertent or ambiguous nonverbal signals are not so dominant. As the number of commuting part-time students and adult learners increase, technologies provide opportunities for interaction not possible when students come to class and leave soon afterward to meet work or family responsibilities.

Schedule and Announcements

How many times have students asked when are homework assignments or projects due? A schedule is another key element in a course (Table 2). Due dates and other important information can be posted on a calendar, another important feature of LMS. Therefore, when a student asks about the due date for any assignment, project or exam, the instructor can tell the student that it is posted on the calendar. The calendar serves as a communication tool. It is an advance organizer to post course-related events, announcements, and due dates. It can be used to post entries to the entire class, a specific group or team, or just one user. Even recurring events can be posted with only one calendar entry⁴. This feature helps pace the class and keeps the students updated throughout the course.

Communication and Messaging

E-mail is a powerful communication tool. The instructor can use e-mail as a quick method to contact students or vice versa. LMS features allow e-mails to handle folders, multiple attachments, options for senders, and forwarding features to another Internet e-mail account if

desired. LMS course mail features supports sending blind carbon copies (BCC) and HTML formatted messages. It also allows the option to change the font within the content of the e-mail.

E-mail is not the only means of interaction between student and student or student and instructor. An instructor can also incorporate synchronous learning through chat rooms, discussion forums, and whiteboards (Table 2). Forums can be defined by type or topic in order to stimulate effective discussion. For example, in ANGEL, multiple team permissions allow for multiple, pedagogically-based models such as Fishbowl, Hot Seat, and Debate ⁴.

Audio and Video

The use of audio and video can transform a lecture and enhance the learning process for each student. In addition, students can identify a voice or a picture with the material that was covered in class. The video allows students not only to hear but also visually see it, which enhances their learning experience (Table 2). Audio and video can be use for the class itself or extra material for better understanding a topic covered in class.

Instructors can post audio and video files on any LMS. These files can be used to either complement or supplement the course material. Instructor lecture notes contained in word files can be combined with the audio files to enhance students' learning experience.

Monitoring Progress and Grades

In a traditional course, the instructor would start class by taking attendance. However, the instructor would not know if students are paying attention in the class lecture. So, how can an instructor closely monitor a student? In LMSs, an instructor can closely monitor a student by the following ³:

- Knowing how many times a student enters a course on line
- Know the duration that a student is in the course on line
- Track how many discussions a student reads and responds
- Track how many content pages a student views

This can help instructors keep track of each student and know which students need more help.

In addition, instructors can grade student work and place it automatically into the grade book provided by a LMS on line. The grades are inputted in a spreadsheet format by assignment, category, user, team, or custom formats. Students are able to view their grades individually by each category or by an overall grade in the class, Table 2.

Site Administration, Navigation, and Interface

In order to be user friendly, the LMS must provide flexibility to help and support the users. LMS is secure and can only be accessed with a user name and password. That facilitates the adoption of these LMS since there is less frustration of new students and/or new faculty that use the LMS. Navigation in a LMS is crucial. When the design of the navigation tool is simple learners find it more interesting and user friendly. Site administration, navigation, and interface features for each LMS can be seen in Table 3.

Student Tools

Study tools on LMS are important for students to help them review course materials. The instructor can post review material, create sample tests, create games for extra study material, create notes or compile messages on the material covered. One major feature that students appreciate in an LMS is a system so that they can search for particular content³. For example, if a student is learning about Monte Carlo simulation, they can search the course content to find all pages that deal with that specific topic. Student tool features in LMS can be seen in Table 3.

LMS Advantages and Disadvantages

E-learning using LMS bring a lot of advantages as stated above. Students can access lecture material, assignments, solutions, etc. on line. This helps them in reading ahead on the lecture, knowing what will be discussed, receiving their grades online, asking questions related to the material covered in class, etc. It is flexible in scheduling for nontraditional students taking courses on-line. In addition, the use of online information for teaching provides more immediacy than traditional textbooks.

A LMS has a lot to offer both faculty and students but there are some setbacks. Class size may be smaller than traditional courses due to the volume of online communication that must be processed by the instructor. In addition, technical limitation and issues might introduce some problems. To resolve these problems, strict attendance and participation policies should be incorporated into the course.

Case Studies

There has been an increase in the use of LMS throughout universities. We have collected data from three universities (of different size), which show a steady increase in the use of LMS. Table 4 shows the number of students with at least one course in ANGEL and the active course section in ANGEL at Pennsylvania State University. The table shows that there has been an increase of ANGEL users from the Fall of 2005 to the Fall of 2006⁵. Table 5 shows in increase of faculty users at the University of Scranton that use Blackboard. This table shows about an 8% increase from the year 2004 to 2006⁶. In addition, a little over 50% of the students at the University of Florida are taking courses on WebCT⁷. These numbers include students that are on campus as well as off campus. Overall there has been a steady increase in the use of LMS.

Conclusions

Instructors who teach with LMS have the flexibility to design and deliver their courses in the way that best fits their teaching style and their students' learning needs. Each LMS has key features that allow students to be actively involved in their courses and on top of their lecture material. The three learning management systems (WebCT, ANGEL, and Blackboard) enhance teaching and learning and engage learners in a deeper learning experience. Overall, the tools offered in LMS assist instructors in course development and design. It also enhances the interaction among students and between instructors and their students. Using these web-based tools assisted both distance and on-campus students. Statistics has shown an increase in use of

LMS in University of Scranton and at Penn State University. In addition, statistics show that the majority of the students at the University of Florida are using WebCT as their main LMS. Instructors need to understand the different features offered for each LMS and how these features will work to make the course more effective and efficient. This will help faculty to choose the appropriate LMS for the students and maximize the effectiveness of these tools. A potential expansion of this paper is to explore how each of these web-based learning tools is chosen by different universities in order to meet the needs of their faculty and students.

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Table 1. Features of WebCT, Blackboard, and ANGEL ^{3, 4, 6, 8}

Topic	Features	WebCT	Blackboard	ANGEL
Course Management	Instructors can select different course components	√	√	√
	Instructors can create a copy of an existing course	√	√	√
	Instructors can hide work in progress	√	√	√
	Instructors can upload files from desktop to server (word, pdf, excel, PowerPoint, etc.)	√	√	√
	Instructors can upload multiple files at once (zipped)	√	√	√
	Instructors can edit uploaded text online	√	√	
	Instructors can release content based on student viewing certain prerequisite materials	√		
	Instructors can release content based on chronological criteria	√	√	√
	Instructors can release content pages based on student quiz performance	√		√
	Instructors can release content to specified groups	√		
	Take timed quizzes, survey, or tests	√	√	√
	Instructors can release feedback within quizzes	√	√	√
	Instructors can release content based on custom designed criteria	√		√
	Instructors can attach learning goals to content pages	√		
	Instructors can attach review questions to content pages	√		√
	Instructors can create references	√	√	√
	Instructors can use automated tools to build glossary	√		
	Instructors can use automated tools to build content index	√	√	
	Use automated tool to build searchable image database	√		
	Instructors can integrate online course with CD-ROM	√		√
Group Participation	Instructors can create groups manually	√	√	√
	Instructors can have program create groups and assign members randomly	√		√
	Users can e-mail members of a group	√	√	√
	Group members can share files	√	√	√
	Group members can have a private chat area		√	√
	Group members can have private bulletin boards	√	√	√
	Group members can have Web content presentation areas	√		
Discussions	Multiple bulletin boards or discussion areas per course	√	√	√
	Private bulletin board/ discussion for each group	√	√	√
	Instructors can allow anonymous postings	√	√	√
	Instructors can move messages from one area to another	√		
	Instructors can delete messages	√	√	√
	Users can mark messages read/unread			√
	Users can view messages based on read/unread status	√	√	√
	Users can view messages as threaded or unthreaded	√	√	√
	Users can compile a self-selected set of postings from bulletin board for their own notes	√		√
	Users receive announcements on login page	√		√
	Users can e-mail posting authors directly from the bulletin board	√	√	√

Table 2. Features of WebCT, Blackboard, and ANGEL (Continued) ^{3, 4, 6, 8}

Topic	Features	WebCT	Blackboard	ANGEL
Calendar	Calendar on login page displays events from all courses	√	√	√
	Announcements from all courses display on login page		√	√
	Instructor can upload multiple events from a file	√		
	Instructor can add links to calendar entries	√	√	√
	Students can add entries to the course calendar (at instructor's discretion)	√		√
Communication and Messaging	External e-mail (accessible through regular e-mail client)		√	√
	Internal e-mail (with forwarding capabilities)	√		
	Instructor can see read e-mail			√
	Chat transcripts/logs	√	√	√
	Multiple chat rooms in a single course	√	√	√
	Restricted access to group chat rooms	√	√	√
	Private messaging in chat		√	√
	Ring in chat (notify another user to chat with them)		√	√
	Alert in chat (receive notification when someone enters chat room)	√	√	√
	Whiteboard facility	√	√	√
	Access whiteboard through chat only		√	
	Save whiteboard images into course content	√		√
	Export whiteboard images	√	√	
Audio and Video	Embed Real, Quick Time, and Media Player in pages	√	√	√
	Embed MP3 in pages	√	√	√
	Add audio and video content that is stored within the courseware	√	√	√
	Add streaming PowerPoint presentations created with Real Video, Real Presenter, Window Media Encoder	√	√	√
Monitoring Progress and Grades	Instructors can analyze the class by combinations of information, such as students who logged in after a certain day and have posted a certain number of articles	√	√	√
	Instructors can view how many bulletin board articles a student has read	√		√
	Instructors can view how many bulletin board articles a student has posted	√	√	√
	Instructors can view a transcript of course chat room activity/discussion	√	√	√
	Student can view own grades	√	√	√
	Student can compare own grade to class summary data	√		√
	Instructors can view number of hits per page	√	√	√
	Instructors can view date and time of each student's first and last login	√	√	√
	Instructors can view complete history of each student's time spent online in entire course	√	√	√
	Instructors can view a graphic breakdown of the percent of total time online each student has spent on each page of content	√		√
	Instructors can view a graphic breakdown of the percent of total time online each student has spent on content areas		√	√

Table 3. Features of WebCT, Blackboard, and ANGEL (Continued) ^{3, 4, 6, 8}

Topic	Features	WebCT	Blackboard	ANGEL
Site Navigation and Interface	Gateway page allows users to view all courses in which they are enrolled	√		√
	Instructor can change page design globally during course design	√		√
	Courseware product defaults to graphic interface	√	√	√
	Courseware product automatically generates header and footer on new pages	√	√	√
	Courseware product provides multiple icon and button styles	√	√	√
	Instructor can substitute buttons or icons of own design	√	√	√
	Instructor can specify a customized course banner	√	√	√
	Instructor can select a custom background color or graphic	√	√	√
	Courseware product can display components of the interface in a language other than English (in student-view only)	√	√	√
	Users can view course map	√	√	√
	Users can search course content	√		√
Site Administration	Users log in with password and login name	√	√	√
	Administrators and instructors can assign multiple instructors to a course	√	√	√
	Administrators can create system-wide accounts (for example, within multiple courses)	√	√	√
	Instructors can automatically upload class roster files	√	√	√
	Instructors can create groups	√	√	√
	Course controls are on a separate page		√	
	Course controls are integrated with student view	√	√	
	Users can navigate with a consistent, logical user interface	√	√	√
	Navigational trail shows the path taken to a particular screen	√	√	√
	Instructors can create an unlimited amount of course content	√	√	
	Instructors can upload and create folders and upload files into a file manager	√		
	Instructors can back up course content	√	√	
	Users can search the on-line manual	√	√	√
	On-line help is context sensitive	√	√	√
	Users can print .pdf versions of the manuals	√	√	√
Users can log out without exiting their browser	√	√	√	
Student Tools	Students can create study guides	√		√
	Students can resume reading content at previous stopping point	√		√
	Students can add notes on course content web page	√		√
	Students can take notes in an internal notepad	√	√	√
	Students can compile a set of e-mail messages	√		
	Students can compile a set of bulletin-board postings	√	√	√
	Students can take self-tests created by the instructor	√		√
	Students can search course material	√		√
	Students can create original content on own web pages	√	√	√
	Students can engage in online games for extra study material	√	√	√

Table 4. ANGEL Users at Pennsylvania State University ⁴

Semester	Number of students with at least one course in ANGEL	Active course sections in ANGEL
Fall 06	74,456	8,815
Spring 06	64,041	7,485
Fall 05	67,313	7,480

Table 5. Blackboard Users at the University of Scranton ⁶

Fall	Percent of Total Faculty Using BB
2006	47.7%
2005	40.4%
2004	40.3%